IN THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently Amended) A method for processing a data stream comprising:

   receiving a data segment;

   determining whether the data segment has been previously stored; and

   in the event that the data segment is determined not to have been previously stored, generating a unique identifier for specifying the data segment in a representation of the data stream;

   wherein determining whether the data segment has been previously stored includes generating a candidate identifier; and determining whether the candidate identifier has been stored previously.

2. (Original) A method for processing a data stream as recited in Claim 1 wherein determining whether the data segment has been previously stored includes generating a content derived summary.

3. (Original) A method for processing a data stream as recited in Claim 1 wherein determining whether the data segment has been previously stored includes generating a content derived summary for the data segment; and the content derived summary is a fingerprint.

4. (Original) A method for processing a data stream as recited in Claim 1 wherein determining whether the data segment has been previously stored includes looking up a content derived summary for the data segment; and the content derived summary is the data segment.

5. (Original) A method for processing a data stream as recited in Claim 1 wherein determining whether the data segment has been previously stored includes generating a content derived summary for the data segment; and locating the content derived summary in a content derived summary storage.

6. (Original) A method for processing a data stream as recited in Claim 1 wherein determining whether the data segment has been previously stored includes locating the data segment in a data segment storage.

7. (Original) A method for processing a data stream as recited in Claim 1 wherein in the event that the data segment is determined not to have been previously stored, further including storing the data segment in a data segment storage location.

8. (Original) A method for processing a data stream as recited in Claim 1 wherein:

determining whether the data segment has been previously stored includes generating a content derived summary for the data segment;

in the event that the data segment is determined not to have been previously stored, further including:

storing the data segment in a data segment storage location; and

updating a data structure for storing the content derived summary, the unique identifier, and the data segment storage location.

9. (Original) A method for processing a data stream as recited in Claim 1 wherein:

determining whether the data segment has been previously stored includes generating a content derived summary for the data segment;

in the event that the data segment is determined not to have been previously stored, further including:

storing the data segment in a data segment storage location; and

updating a data structure for storing the content derived summary, the unique identifier, and the data segment storage location; wherein

the data segment storage location is accessed given the unique identifier or given the content derived summary in the data structure.

10. (Original) A method for processing a data stream as recited in Claim 1 wherein:

determining whether the data segment has been previously stored includes generating a content derived summary for the data segment;

in the event that the data segment is determined not to have been previously stored, further including:

storing the data segment in a data segment storage location; and

updating a data structure for storing the content derived summary, the unique identifier, and the data segment storage location; wherein

the data segment storage location is accessed given the unique identifier or given the content derived summary, using a single access of a storage device.

11. (Original) A method for processing a data stream as recited in Claim 1 wherein:

determining whether the data segment has been previously stored includes generating a content derived summary for the data segment;

in the event that the data segment is determined not to have been previously stored, further including:

storing the data segment in a data segment storage location; and

updating a data structure for storing the content derived summary, the unique identifier, and the data segment storage location; wherein

a region of the data structure that includes the data segment storage location is accessed given the unique identifier or given the content derived summary, using a single access of a storage device.

12. (Previously presented) A method for processing a data stream as recited in Claim 1, wherein the unique identifier does not depend on probability for its uniqueness, and is shorter than a signature of the data segment.

13. (Original) A method for processing a data stream as recited in Claim 1, wherein the unique identifier is a serial number.

14. (Original) A method for processing a data stream as recited in Claim 1, wherein the unique identifier is derived from a hash value.

15. (Original) A method for processing a data stream as recited in Claim 1, wherein the unique identifier is an address of the data segment.

16. (Original) A method for processing a data stream as recited in Claim 1, wherein the unique identifier is a shortest identifier for uniquely identifying the data segment.

17. (Original) A method for processing a data stream as recited in Claim 1, wherein determining whether the data segment has been previously stored includes generating a content derived summary for the data segment; and the unique identifier is derived from the content derived summary.

18. (Original) A method for processing a data stream as recited in Claim 1, wherein determining whether the data segment has been previously stored includes generating a content derived summary for the data segment; and the unique identifier includes a value derived from the content derived summary and a serial number.

19. (Original) A method for processing a data stream as recited in Claim 1, wherein the representation of the data stream is a compressed representation.

20. (Original) A method for processing a data stream as recited in Claim 1, wherein the representation of the data stream is used for reconstructing the data stream.

21. (Cancelled)

22. (Currently Amended) A method for processing a data stream as recited in Claim 1, wherein:

~~determining whether the data segment has been previously stored includes generating a candidate identifier; and determining whether the candidate identifier has been stored previously;~~

generating a unique identifier for specifying the data segment includes modifying the candidate identifier.

23. (Previously presented) A method for processing a data stream as recited in Claim 22, wherein modifying the candidate identifier includes adding a value to the candidate identifier.

24. (Previously presented) A method for processing a data stream as recited in Claim 22, wherein modifying the candidate identifier includes combining an additional bit with the candidate identifier.

25. (Previously presented) A method for processing a data stream as recited in Claim 22, wherein modifying the candidate identifier includes combining a plurality of bits with the candidate identifier.

26. (Original) A method for processing a data stream as recited in Claim 1, wherein the unique identifier is stored in a reconstruction list.

27. (Original) A method for processing a data stream as recited in Claim 1, in the event that the data segment is determined to have been previously stored, further including locating a unique identifier previously assigned to the data segment.

28. (Original) A method for processing a data stream as recited in Claim 1, in the event that the data segment is determined to have been previously stored, further including locating a unique identifier previously assigned to the data segment; and the unique identifier is stored in a reconstruction list.

29. (Currently Amended) A method for processing a data stream as recited in Claim 1, further comprising:

~~determining whether the data segment has been previously stored; and~~

in the event that the data segment is determined not to have been previously stored, storing the data segment.

30. (Currently Amended) A system for processing a data stream comprising:

an interface configured to receive a data segment;

a processor coupled to the interface, configured to:

determine whether the data segment has been previously stored; and

in the event that the data segment is determined not to have been previously stored, generate a unique identifier for specifying the data segment in a representation of the data stream;

<u>wherein to determine whether the data segment has been previously stored includes to generate a candidate identifier; and to determine whether the candidate identifier has been stored previously.</u>

31. (Currently Amended) A computer program product for processing a data stream, the computer program product being embodied in a computer readable medium and comprising computer instructions for:

receiving a data segment;

determining whether the data segment has been previously stored; and

in the event that the data segment is determined not to have been

previously stored, generating a unique identifier for specifying the data segment in a

representation of the data stream;

wherein determining whether the data segment has been previously stored

includes generating a candidate identifier; and determining whether the candidate

identifier has been stored previously.

32. (New) A system as recited in Claim 30, wherein to determine whether the data segment

has been previously stored includes to generate a content derived summary.

33. (New) A system as recited in Claim 30, wherein to determine whether the data segment

has been previously stored includes to locate the data segment in a data segment storage.

34. (New) A system as recited in Claim 30, wherein in the event that the data segment is

determined not to have been previously stored, the processor is further configured to store

the data segment in a data segment storage location.

35. (New) A system as recited in Claim 30, wherein the unique identifier does not depend on

probability for its uniqueness, and is shorter than a signature of the data segment.

36. (New) A system as recited in Claim 30, wherein to determine whether the data segment

has been previously stored includes to generate a content derived summary for the data

segment; and the unique identifier is derived from the content derived summary.

37. (New) A system as recited in Claim 30, wherein to determine whether the data segment

has been previously stored includes to generate a content derived summary for the data

segment; and the unique identifier includes a value derived from the content derived

summary and a serial number.

38. (New) A system as recited in Claim 30, wherein the representation of the data stream is a compressed representation.

39. (New) A system as recited in Claim 30, wherein the representation of the data stream is used for reconstructing the data stream.

40. (New) A system as recited in Claim 30, wherein the unique identifier is stored in a reconstruction list.

41. (New) A system as recited in Claim 30, in the event that the data segment is determined to have been previously stored, the processor is further configured to locate a unique identifier previously assigned to the data segment.

42. (New) A computer program product as recited in Claim 31, wherein determining whether the data segment has been previously stored includes generating a content derived summary.

43. (New) A computer program product as recited in Claim 31, wherein determining whether the data segment has been previously stored includes locating the data segment in a data segment storage.

44. (New) A computer program product as recited in Claim 31, wherein in the event that the data segment is determined not to have been previously stored, the computer program product further comprising computer instructions for storing the data segment in a data segment storage location.

45. (New) A computer program product as recited in Claim 31, wherein the unique identifier does not depend on probability for its uniqueness, and is shorter than a signature of the data segment.

46. (New) A computer program product as recited in Claim 31, wherein determining whether the data segment has been previously stored includes generating a content derived

summary for the data segment; and the unique identifier is derived from the content derived summary.

47. (New) A computer program product as recited in Claim 31, wherein determining whether the data segment has been previously stored includes generating a content derived summary for the data segment; and the unique identifier includes a value derived from the content derived summary and a serial number.

48. (New) A computer program product as recited in Claim 31, wherein the representation of the data stream is a compressed representation.

49. (New) A computer program product as recited in Claim 31, wherein the representation of the data stream is used for reconstructing the data stream.

50. (New) A computer program product as recited in Claim 31, wherein the unique identifier is stored in a reconstruction list.

51. (New) A computer program product as recited in Claim 31, in the event that the data segment is determined to have been previously stored, the computer program product further comprising computer instructions for locating a unique identifier previously assigned to the data segment.